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Here, on Mt. Rose, Nevada, Dr. J. E. Church made the first western snow survey 50 years ago.

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U. S. DEPARTMENT OF AGRICULTURE

FEDERAL - STATE - PRIVATE COOPERATIVE

SNOW SURVEY and WATER SUPPLY FORECASTS for MONTANA & NORTHERN WYOMING

UNITED STATES DEPARTMENT of AGRICULTURE···SOIL CONSERVATION SERVICE,
and
MONTANA AGRICULTURAL EXPERIMENT STATION

In cooperation with the U.S. Forest Service, U.S. Geological Survey, National Park Service, U.S. Bureau of Reclamation, State Engineers of Montana and Wyoming and other Federal, State and private organizations.

AS OF
APR. 1, 1959

UNITED STATES DEPARTMENT OF AGRICULTURE - SOIL CONSERVATION SERVICE

TO RECIPIENTS OF COOPERATIVE SNOW SURVEY AND WATER SUPPLY FORECAST REPORTS:

The climate of the cultivated and populated areas of the West is characterized by relatively dry summer months. Such precipitation as occurs falls mostly in the winter and early spring months when it is of little immediate benefit to growing crops. Fortunately, most of this precipitation falls as mountain snow which stays on the ground for months, melting later to sustain streamflow during the period of greatest demand during late spring and summer. Thus, nature provides in mountain snow an imposing water storage facility.

The amount of water stored in mountain snow varies from place to place as well as from year to year and accordingly, so does the runoff of the streams. The best seasonal management of variable western water supplies results from fore-knowledge of the runoff.

A snow survey consists of a series of about ten samples taken with specially designed snow sampling equipment along a permanently marked line, about 1000 feet in length, called a snow course. The use of snow sampling equipment provides snow depth and water equivalent values for each sampling point. The average of these values is reported as the snow survey measurement for a snow course.

Snow surveys are made monthly or semi-monthly beginning in January or February and continue through the snow season until April, May or June. Currently more than 1300 western snow courses are measured each year. These measurements furnish the key data for water supply forecasts.

By relating snow survey measurements taken over a period of years to spring-summer runoff during the same period, relationships have been developed which make it possible to forecast seasonal runoff several months in advance of occurrence. In order to make a forecast, once a forecast relationship has been developed, the maximum snow water content at previously selected key snow courses is usually entered in the forecast relationship. More accurate forecasts are often obtained when other factors such as soil moisture, base flow and spring precipitation are considered and included in the forecast relationships.

Listed below are the Federal-State-Private Cooperative Snow Survey and Water Supply Forecast reports available for the West which contain detailed information on snow survey measurements, streamflow forecasts, reservoir storage, soil moisture and other guide data to water management and conservation decisions.

PUBLISHED BY SOIL CONSERVATION SERVICE

REPORTS	ISSUED	COOPERATING WITH	LOCATION
RIVER BASINS			
Colorado, Rio Grande and Arkansas	Monthly (Feb.-May)	Colo. Exp. Station Colo. State Engineer New Mexico State Engineer	Ft. Collins, Colo.
Columbia *Includes Alaska*	Monthly (Jan.-May)	Idaho State Engineer	Boise, Idaho
Upper Missouri	Monthly (Feb.-May)	Mont. Agr. Exp. Station	Bozeman, Montana
West-Wide	(Oct. 1, Apr. 1 and May 1)	Cooperators	Portland, Oregon
STATES			
Arizona	Semi-Monthly (Jan. 15-Apr. 1)	Salt R. Valley Water Users Association	Phoenix, Arizona
Nevada	Monthly (Feb.-Apr.)	Nevada State Engineer	Reno, Nevada
Oregon	Monthly (Jan.-May)	Ore. Agr. Exp. Station	Portland, Oregon
Utah	Monthly (Jan.-May)	Utah State Engineer Utah Agr. Exp. Station	Salt Lake City, Utah
Washington	Monthly (Feb.-May)	Wash. State Dept. of Conservation	Spokane, Washington
Wyoming	Monthly (Feb.-June)	Wyoming State Engineer	Casper, Wyoming

Copies of the various reports may be secured from: Head, Water Supply Forecasting Section
Soil Conservation Service
209 S.W. 5th Avenue, Portland 4, Oregon

PUBLISHED BY OTHER AGENCIES

OTHER SNOW SURVEY REPORTS			
British Columbia	Monthly (Feb.-June)	Comptroller, Water Rights Br., Dept. of Lands and Forests, Parliament Bldgs.	Victoria, B.C.
California	Monthly (Feb.-May)	California Department of Water Resources	Sacramento, California

FEDERAL-STATE-PRIVATE COOPERATIVE

SNOW SURVEYS and WATER SUPPLY FORECASTS

for

MONTANA AND NORTHERN WYOMING

(Upper Missouri and Upper Columbia River Basins)

Report Prepared by:

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Soil Conservation Service
U. S. Department of Agriculture
and
Montana Agricultural Experiment Station
Bozeman, Montana

Report Issued by:

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State Conservationist
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Montana Agricultural
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R. E. Huffman
Director
Montana Agricultural
Experiment Station

WATER SUPPLY OUTLOOK
FOR MONTANA
April 1, 1959

The Water Supply Outlook for Montana is fair to excellent for the 1959 irrigation season.

Missouri River basin streams are expected to flow between 80 and 114 percent average this season. Columbia River basin streams are forecast to flow 109 to 166 percent average this season.

An exceptionally heavy snow-pack covers the Swan River, Blackfoot River and Mission Range. April first Snow Survey measurements are six inches of water content above previous records, and 20 inches of water content above average. This heavy snow-pack is likely to cause high water from the Blackfoot and Clark Fork Rivers above Missoula and also in the Swan River to Big Fork. The Flathead River has a good snow-pack. There is a heavy snow-pack in the mountains surrounding the Swan and Blackfoot Rivers.

Irrigation and hydroelectric reservoirs are above average for April first.

Soil Moisture under the snow-pack is greater by two inches than it was in 1958 or 1957.

MISSOURI RIVER BASIN

JEFFERSON RIVER:

The southern portion of the Beaverhead River and Soil Conservation District above Armstead has a light snow-pack this season; the average is only 64 percent of last season and 86 percent average. The snow-pack in the Horse Prairie area is slightly better than last season and 84 percent average. The Big Hole snow survey courses show this year's snow-pack to be 14 percent greater than last year. Stream flow forecasts for these streams are listed with comparison data on the stream flow forecast sheets of this report.

MADISON RIVER:

April first Snow Surveys show this season's snow-pack to be 15 percent below average, but 4 percent better than last year. The Madison River is forecast to flow 93 percent average near West Yellowstone from April through September or about 7 percent greater than last season.

GALLATIN RIVER:

The 1959 snow-pack on the headwaters of the Gallatin River is 23 percent greater than last season and 20 percent better than average. A comparable water supply is anticipated.

MISSOURI RIVER MAIN STEM:

The Missouri River from Toston to Fort Benton is forecast to produce from 80 to 100 percent average flow. Tributary streams should flow adequate volumes of water during the early and middle portions of the irrigation season, with the usual shortages on unregulated streams. The heavy snow accumulation on the Blackfoot and Swan Rivers extends into the upper portion of the Sun River.

The inflow into Gibson Reservoir is forecast to be 154 percent average or 885,000 acre feet from April through September, and 809,000 acre feet from April through July. These forecasts are 57 percent greater than last season's runoff.

The flow into Fort Peck Reservoir is forecast to be very close to average, which is 101 percent or 4,417,000 acre feet during the April-September period.

YELLOWSTONE RIVER:

The 1959 April first snow-pack in Yellowstone Park is 9 percent greater than last season and 87 percent average. The Yellowstone River is forecast to flow 1,792,000 acre feet at Corwin Springs from April through September, which is 27 percent greater than last season.

The Stillwater River at Absarokee is forecast to flow 596,000 acre feet during the April-September period. This figure is only 2,000 acre feet above the 15-year average flow for this stream. There should be ample water for irrigation.

The Clarks Fork River at Chance is forecast to flow 4 percent above average during April through July.

COLUMBIA RIVER BASIN

FLATHEAD RIVER:

The April first Snow Surveys show the 1959 snow-pack to be above average and 30 percent greater than last season. April first stream flow forecasts are slightly lower than March first forecasts. During March the accumulation of snow was below average on the tributary watersheds to the north, west, and east of Kalispell. There were heavy storms to the south of Kalispell Lake.

The Swan River basin on the Mission Range received the brunt of these storms during February and March. Snow Surveys at Strawberry Lake, Trinkus Lake, Upper Holland Lake, Big Creek (west of Polson) and North Fork Jocko (west of St. Ignatius) have record high water content measurements. Big Creek and North Fork Jocko snow courses show the greatest water content by 6 inches in 18 years of record. Streams from the Mission Range and the Swan River will reflect this tremendous snow-pack during the melt season.

CLARK FORK RIVER:

The Blackfoot River basin also has a heavy snow-pack. Stemple Pass snow course at the east end of this basin, just above Lincoln, has a record high water content. With North Fork Jocko Creek snow course at the west end having a record high snow-pack, the Blackfoot River near Bonner is forecast to discharge 165 percent average volume from April through July and April through September. Extremely high flows are anticipated during the melt season.

Although the Clark Fork above the confluence of the Blackfoot is forecast to be only 15 percent above average, the flow below the confluence of these two streams is forecast to be 150 percent average.

The Bitterroot River basin snow-pack is only 10 percent above average. The Bitterroot River is forecast to flow 561,000 acre feet during the April-September period or 107 percent average.

On the Clark Fork River at St. Regis, the percent average flow decreases to 135 percent. The Clark Fork River at Plains is forecast to discharge 12,977,000 acre feet of water during April-September or 21 percent above average.

MONTANA STREAM-FLOW FORECASTS APRIL 1, 1959

The following summarized runoff forecasts are based principally on mountain snow cover and on the assumption that precipitation and temperature during the forecast period will be near average. Appreciable deviations from normal of temperature and/or precipitation during the forecast period will correspondingly modify these forecasts.

UPPER MISSOURI RIVER IN MONTANA		Seasonal Stream-Flow in Thousands of Acre Feet					
		FORECAST RUNOFF	% 15-Yr. AVG.	FORE-CAST PERIOD	Measured Runoff 1957##	Measured Runoff 1956	1938-52 Average
RED ROCK RIVER							
Monida (near) (1)	#5	60.6	75	Apr-Sept	104	60	81
		56.7	75	Apr-July	100	58	76
BEAVERHEAD RIVER							
Barratts (at)	#9	143	81	Apr-Sept	204	155	177
		109	81	Apr-July	162	122	134
BIG HOLE RIVER							
Melrose (near)	#85	632	85	Apr-Sept	720	842	745
		585	85	Apr-July	686	796	687
JEFFERSON RIVER							
Sappington (at)	#14	881	83	Apr-Sept	1028	1045	1057
		782	83	Apr-July	964	967	938
MADISON RIVER							
West Yellowstone (near)	#104	183	93	Apr-Sept	220	255	198
		140	93	Apr-July	168	200	151
Grayling (near) (2)	#106	382	91	Apr-Sept	454	488	420
(Net inflow to Hebgen Lk)		302	91	Apr-July	361	402	333
McAllister (near) (3)	#109	661	91	Apr-Sept	750	802	726
		533	91	Apr-July	615	672	585
GALLATIN RIVER							
Gateway (near)	#114	489	110	Apr-Sept	469	499	445
		421	110	Apr-July	406	443	384
Logan (at)	#116	541	113	Apr-Sept	446	512	478
		464	113	Apr-July	386	452	410
Hyalite Cr. R.S.(at)(7)	#118	40.0	114	Apr-Sept	34	29	35
		34.1	114	Apr-July	30	25	30
MISSOURI RIVER							
Toston (at) (3)	#15	2080	79	Apr-Sept	2187	2345	2535*
		1760	80	Apr-July	1956	2098	2191*
Fort Benton (at) (4)	#25	3341	99	Apr-Sept	3032	3131	3381
		2817	98	Apr-July	2608	2722	2874
Virgelle (at) (4)	#26	4085	101	Apr-Sept	3500	3261	4013
(Loma)		3488	101	Apr-July	3019	2806	3445
Zortman (near) (4)	#27	4417	101	Apr-Sept	3739	3588	4357
		3759	101	Apr-July	3208	3076	3726
Ft. Peck Dam(below)(5)	#29	4336	99	Apr-Sept	3365	3290	4362
		3757	102	Apr-July	2728	2613	3666
Williston, N. D.	#33	10846	92	Apr-Sept	11203	9673	11750
		9374	92	Apr-July	9527	8102	10228

(1) Observed flow plus change in Storage in Lima Reservoir.
(2) Observed flow plus change in Storage in Hebgen Lake.
(3) Observed flow plus change in Storage in Hebgen and Ennis Lakes.
(4) Observed flow plus change in Storage in Canyon Ferry.
(5) Observed flow plus change in Storage in Canyon Ferry and Ft. Peck Reservoirs.
(7) Observed flow plus change in Storage in Hyalite Reservoir.
(##) Preliminary data furnished by U. S. Geological Survey, subject to correction.
(*) Less than 15 years in 1938-52 period. Average for 15 years nearest the base period.

MONTANA STREAM-FLOW FORECASTS APRIL 1, 1959

UPPER MISSOURI RIVER IN MONTANA		Seasonal Stream-Flow in Thousands of Acre Feet FORECAST RUNOFF	% 15-Yr. AVG.	FORE-CAST PERIOD	Measured Runoff 1957##	Measured Runoff 1956	1938-52 Average
SUN RIVER							
Net Inflow to Gibson Reservoir	#1535	885	154	Apr-Sept	531	668	573
		809	154	Apr-July	488	618	524*
MARIAS RIVER							
Shelby (near)	#178	608	115	Apr-Sept	519	684	527
		559	116	Apr-July	486	617	482
JUDITH RIVER							
Utica (near)	#208	40.5	102	Apr-Sept	29.2	18.4	39.8
		37.2	102	Apr-July	27.6	17.6	36.3
MUSSELSHELL RIVER							
Delpine (near)	#216	8.2	121	Apr-Sept	6.0	4.8	6.8*
		6.7	120	Apr-July	4.9	4.1	5.6*
YELLOWSTONE RIVER							
Corwin Springs (at)	#317	1792	96	Apr-Sept	1964	2427	1870
		1495	96	Apr-July	1643	2099	1556
Livingston (near)	#318	2038	96	Apr-Sept	2272	2689	2134
		1683	95	Apr-July	1902	2322	1770
Billings (at)	#319	3659	91	Apr-Sept	5133	4788	4025
		3142	91	Apr-July	4521	4225	3446
Miles City (at)	#323	5842	92	Apr-Sept	7762	6175	6369
		5000	92	Apr-July	6764	5324	5421
Sidney (near)	#326	6054	91	Apr-Sept	7623	6114	6648
		5246	92	Apr-July	6735	5315	5724
SHIELDS RIVER							
Clyde Park (at)	#335	95.4	90	Apr-Sept	76.5	97.0	105.6
		88.8	91	Apr-July	71.8	94.2	98.0
ROSEBUD RIVER							
Absarokee (near)	#356	267	102	Apr-Sept	372	251	263
		215	101	Apr-July	321	208	212
STILLWATER RIVER							
Rosebud Cr. (above)	#3515	333	101	Apr-Sept	463	343	331
		290	101	Apr-July	413	321	288
Absarokee (near)	#352	596	100	Apr-Sept	850	611	594
		501	100	Apr-July	750	529	500
ROCK CREEK							
Red Lodge (near)	#365	107	100	Apr-Sept	154	134	107
		82	100	Apr-July	129	110	82
CLARK FORK RIVER							
Chance (at)	#360	599	103	Apr-Sept	715	716	580
		536	104	Apr-July	649	660	517
Edgar (at)	#362	619	101	Apr-Sept	785	773	614
		547	102	Apr-July	706	698	539

(##) Preliminary data furnished by U. S. Geological Survey, subject to correction.
(*) Less than 15 years in 1938-52 period. Average for 15 years nearest the base period.

MONTANA STREAM-FLOW FORECASTS APRIL 1, 1959

UPPER COLUMBIA RIVER IN MONTANA		Seasonal Stream-Flow in Thousands of Acre Feet					
		FORECAST RUNOFF	% 15-Yr AVG.	FORE-CAST PERIOD	Measured Runoff 1957##	Measured Runoff 1956	1938-52 Average
CLARK FORK RIVER							
Bonner (above) (14)	#4155	890	115	Apr-Sept	655	880	771
		784	116	Apr-July	580	780	678
		671	115	Apr-June	522	695	583
Missoula (above)	#415	2392	149	Apr-Sept	1577	2012	1602
		2137	150	Apr-July	1425	1817	1429
		1837	150	Apr-June	1292	1622	1229
Missoula (below)	#439	3999	135	Apr-Sept	2979	3960	2971
		3646	135	Apr-July	2764	3654	2700
		3194	136	Apr-June	2524	3290	2335
St. Regis (at)	#442	5367	135	Apr-Sept	4108	5749	3951
		4868	136	Apr-July	3787	5326	3588
		4313	138	Apr-June	3450	4817	3112
Plains (near) (15)	#503	12977	121	Apr-Sept	11159	15138	10747
		11850	121	Apr-July	10459	14070	9813
		10185	121	Apr-June	9527	12531	8434
Thompson Falls (at)(15)	#504	13855	121	Apr-Sept	11517	15920	11479
		12673	121	Apr-July	10802	14809	10500
		10874	121	Apr-June	9847	13188	9009
Cabinet Gorge (at)(15)	#507	14738	121	Apr-Sept	-	-	12211
		13502	121	Apr-July	-	-	11186
		11568	121	Apr-June	-	-	9584
BLACKFOOT RIVER							
Bonner (near)	#414	1502	166	Apr-Sept	922	1132	896**
		1353	167	Apr-July	844	1037	811**
		1166	168	Apr-June	769	927	693**
BITTERROOT RIVER							
Darby (near)	#422	561	107	Apr-Sept	515	740	525
		521	108	Apr-July	483	701	487
		455	106	Apr-June	441	649	429
Missoula (near)	#438	1607	117	Apr-Sept	1402	1948	1369
		1509	119	Apr-July	1340	1837	1270
		1357	122	Apr-June	1232	1668	1106

(14) Difference in observed flow, Clark Fork above Missoula & Blackfoot at Bonner.
(15) Observed flow plus change in Storage in Flathead Lake & Hungry Horse Reservoir.
(16) Difference in observed flow, Clark Fork above and below Missoula.
(**) Average for period of record.
(##) Preliminary data furnished by U. S. Geological Survey, subject to correction.

MONTANA STREAM-FLOW FORECASTS APRIL 1, 1959

UPPER COLUMBIA RIVER IN MONTANA		Seasonal Stream-Flow in Thousands of Acre Feet					
		FORECAST RUNOFF	% 15-Yr. AVG.	FORE-CAST PERIOD	Measured Runoff 1957##	Measured Runoff 1956	1938-52 Average
FLATHEAD RIVER							
Columbia Falls (near)	#444	1923	111	Apr-Sept	1798	2308	1729
(North Fork)		1752	111	Apr-July	1681	2139	1575
		1508	112	Apr-June	1523	1864	1350
Columbia Falls (at)(17)	#458	6153	110	Apr-Sept	5716	7164	5619
		5736	110	Apr-July	5411	6720	5214
		5027	111	Apr-June	4962	5959	4530
Polson (near) (15)	#469	7222	109	Apr-Sept	6525	8603	6612
		6718	109	Apr-July	6240	8082	6150
		5808	109	Apr-June	5715	7137	5317
MIDDLE FORK FLATHEAD RIVER							
West Glacier (near)	#450	1848	111	Apr-Sept	1764	2093	1659*
		1711	111	Apr-July	1672	1956	1540*
		1444	109	Apr-June	1524	1712	1330*
SOUTH FORK FLATHEAD RIVER							
Columbia Falls (near)(17)	#457	2263	110	Apr-Sept	1976	2593	2058
(Net Inflow to Hungry		2148	110	Apr-July	1857	2488	1950
Horse Reservoir)		1914	111	Apr-June	1778	2279	1724
SWAN RIVER							
Big Fork (near)	#466	848	145	Apr-Sept	575	750	584
		754	146	Apr-July	520	676	518
		628	147	Apr-June	451	581	427

(15) Observed flow plus change in Storage in Flathead Lake & Hungry Horse Reservoir.
(17) Observed flow plus change in Storage in Hungry Horse Reservoir.
(##) Preliminary data furnished by U. S. Geological Survey subject to correction.

AVAILABLE SOIL MOISTURE - ABOUT APRIL 1, 1959

Station	No.	Elev.	PROFILE Depth (In.)	PROFILE Total Water-Holding Capacity (In.)	Date of Meas.	SOIL MOISTURE CONTENT in Inches 1959	Past Record 1958	Past Record 1957	Yrs.
			COLUMBIA-FLATHEAD DRAINAGE						
Desert Mt.	13A2M	5600	48	--	3/27	7.65	4.18	5.63	3
Marias Pass	13A5M	5250	48	8.39	4/1	6.66	5.85	5.70	3
Spotted Bear R.S.	13B2M	3700	28	--	4/2	5.30	5.07	5.76	3
Trout Lake	13A12M	3600	48	--	4/2	11.99	12.54	12.64	3
			MISSOURI-GALLATIN DRAINAGE						
College Site	11D2M	4860	50	14.48	4/3	9.00	8.18	9.74	3

COMPARISON OF SNOW COVER WITH THAT OF PREVIOUS YEARS

Summary of Snow-Survey Data by Tributary Watersheds April 1, 1959

TRIBUTARY BASINS	No. of Courses Averaged	No. Years Used	1959 Snow Water Equivalent Expressed as Percent of		
			1958	1957	Average
MISSOURI RIVER BASIN IN MONTANA					
JEFFERSON RIVER	24	11-15	95	89	86
Rock-Beaverhead	6	11-15	64	97	65
Horse Prairie	6	11	104	80	84
Big Hole	8	11-15	114	92	94
Wise River	3	11-15	100	80	86
Ruby River	1	14	68	82	67
MADISON RIVER	7	15	104	71	85
GALLATIN RIVER	4	15	123	124	120
MISSOURI MAIN STEM	20	10-15	134	150	117
Teton River	4	11	145	134	100
Sun River	7	10-15	157	156	120
Marias River	1	15	149	115	120
Milk River	1	15	106	70	60
Musselshell River	1	15	107	194	118
UPPER YELLOWSTONE	7	15	109	84	87
COLUMBIA RIVER BASIN IN MONTANA					
KOOTENAI ABOVE LIBBY	15	8-15	129	105	111
FLATHEAD RIVER	21	8-15	136	138	130
UPPER CLARK FORK	27	6-15	116	116	115
BITTERROOT RIVER	11	15	110	99	105

MONTANA SNOW SURVEYS ABOUT APRIL 1, 1959

MISSOURI DRAINAGE BASIN AND SNOW COURSE	No.	Elev.	SNOW COVER MEASUREMENTS: Date of Survey	1959 Snow Depth (In.)	1959 Water Content (In.)	Past Record Water Content (In.) 1958	Past Record Water Content (In.) 1957	Past Record 15-Year Average 1938-52	Total Years of Record
JEFFERSON RIVER									
(Rock-Beaverhead)									
Lakeview Canyon	11E4	6930	4/1	33	8.3	14.3	13.4	11.2**	11
Lakeview Ridge	11E3	7400	4/1	28	6.6	12.9	12.2	9.4**	11
Limekiln	12E2	6950	3/23	0	0	1.6	0	1.7**	11
White Pine Ridge	12E1	8850	3/23	16	3.6	8.0	3.7	6.5**	11
#Blue Ledge Mine	11E11	6700	3/29	36	12.2	17.1	16.0	16.6	20
#Camp Creek	12E3	6800	3/30	31	8.5	12.3	10.1	10.0	23
#Kilgore	11E12	6200	3/31	27	8.8	9.9	10.1	11.0	21
(Horse Prairie)									
Bloody Dick	13D10	7600	3/30	37	10.8	9.6	13.7	12.4**	11
Gold Stone	13D9	8100	3/30	50	14.0	12.7	17.1	16.3**	11
Lemhi Pass	13E1	7400	3/25	32	8.7	8.8	9.6	9.9**	11
Selway Junction	13D11	6800	3/24	25	6.9	7.3	10.4	9.5**	11
Terrell Creek	13D12	6650	3/24	18	5.1	4.8	6.1	5.1**	11
Trail Creek	13E2	7090	3/25	25	7.7	8.0	9.6	9.3**	11
(Big Hole)									
Below Big Hole Pass	13D4	6900	4/1	46	14.1	12.0	15.6	15.6**	11
Big Hole Pass	13D3	7440	4/1	49	15.8	14.4	16.8	18.6**	11
East Boundary	13D5	6700	4/1	27	8.3	6.4	8.6	9.2**	11
Gibbons Pass	13D2	7100	3/31	68	23.5	23.1	24.7	23.8*	20
Jahnke Creek	13D8	7340	3/30	33	10.0	9.0	14.0	12.2**	11
Miner Forks	13D6	7300	3/31	42	13.2	10.5	14.2	13.5**	11
Miner Lake	13D7	6720	3/31	30	10.8	6.0	9.6	8.9**	14
#Moose Creek	13D16	6200	3/27	42	14.8	15.8	16.4	16.2	22
Storm Lake	13C7	7780	3/23	50	15.6	14.4	12.0	14.8*	20
(Wise River)									
Anderson Meadow	13D14	7000	4/2	23	6.3	7.2	8.6	9.0**	11
Elk Horn	13D15	8450	3/31	37	10.3	9.5	10.5	9.5	20
Wise River	13D13	6300	4/2	12	4.4	4.4	6.1	5.8**	11
(Ruby River)									
Flashlight	12D3	6950	3/26	12	4.1	6.0	5.0	6.0**	14

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** Average for period of record.
Adjacent Basin.

MONTANA SNOW SURVEYS ABOUT APRIL 1, 1959

MISSOURI DRAINAGE BASIN AND SNOW COURSE	No.	Elev.	SNOW COVER MEASUREMENTS 1959 Date of Survey	1959 Snow Depth (In.)	1959 Water Content (In.)	Past Record Water Content (In.) 1958	1957	15-Year Average 1938-52	Total Years of Record
MADISON RIVER									
Hebgen	11E5	6550	3/26	37	11.3	11.6	14.3	12.2	23
Norris Basin	10E2	7500	4/1	31	8.5	7.8	10.8	9.4*	20
21-Mile	11E6	7150	3/26	48	15.8	13.5	21.0	17.5	22
W. Yellowstone	11E7	6700	3/26	30	9.2	7.6	14.2	11.8	22
#Big Springs	11E9	6500	3/31	55	16.9	18.0	26.6	21.3	23
#Island Park	11E10	3600	3/31	44	13.7	14.4	19.4	16.4	23
#Valley View	11E8	6500	3/31	44	13.8	12.5	18.1	15.3	23
GALLATIN RIVER									
Devil's Slide	10D4	8100	3/28	78	28.0	21.4	19.1	20.6*	20
Hood Meadow	10D3	6600	3/28	37	11.4	9.6	7.8	9.2*	20
Mystic Lake	10D2	6600							
New World	10D1	6700	3/25	46	13.4	11.2	7.9	10.2*	20
21-Mile	11E6	7150	3/26	48	15.8	13.5	21.0	17.5	22
MISSOURI RIVER MAIN STEM									
Chessman Res.	12C5	6200	3/31	20	6.0	4.5	2.5	4.7	23
Crystal Lake	9C1	6100	4/3	51	16.9	12.4	9.0	12.2	18
Grasshopper	10C2	7000	4/1	24	6.4	6.0	3.3	5.4	21
King's Hill	10C1	7950	3/27	52	16.6	13.4	11.9	13.3*	20
Picnic Grounds	13C6	6500	4/1	16	4.5	5.1	3.9	4.6**	13
Pipestone Pass	12D1	7200	3/31	23	6.2	8.4	6.5	5.7*	20
Stemple Pass	12C1	6900	3/30	47	15.1	11.5	9.2	9.8*	20
Tenmile, Lower	12C2	6250	3/28	26	7.9	7.1	5.0	6.5	23
Tenmile, Middle	12C3	6800	3/27	39	11.8	11.3	8.8	10.5	23
Tenmile, Upper	12C4	8000	3/27	47	16.1	14.7	11.4	13.5	23
(Teton River)									
Freight Creek	12A1	6000	3/30	55	20.4	12.4	14.4	18.0*	11
Waldron Creek	12B2	5600	3/31	25	7.7	6.1	6.8	8.2**	11
West Fork	12B1	6000	3/30	44	16.8	12.2	12.4	18.8*	11
(Sun River)									
Benchmark	12B8	5500	4/1	27	8.8	7.3	6.0	10.8**	10
Cabin Creek	12B6	5400	4/3	31	10.1	5.5	3.8	7.3**	10
5-Bull	12B9	5600	4/1	25	8.5	5.9	4.2	8.2**	10
Gates Park	12B5	5300	4/3	42	13.9	8.2	8.2	11.4**	10
Goat Mountain	12B7	7000	3/29	48	15.4	9.7	10.2	10.3**	20
Wrong Creek	12B4	5700	4/3	50	19.7	13.1	13.8	16.4**	10
Wrong Ridge	12B3	6800	4/3	69	27.1	16.8	20.8	23.5**	10

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Adjacent Basin.

MONTANA SNOW SURVEYS ABOUT APRIL 1, 1959

MISSOURI DRAINAGE BASIN AND SNOW COURSE	No.	Elev.	SNOW COVER MEASUREMENTS 1959 Date of Survey	1959 Snow Depth (In.)	1959 Water Content (In.)	Past Record Water Content (In.) 1958	1957	15-Year Average 1938-52	Total Years of Record
MISSOURI RIVER MAIN STEM (Cont'd)									
(Marias River)									
Marias Pass	13A5	5250	3/28	59	21.1	14.2	18.4	17.6	23
(Milk River)									
Rocky Boy	9A1	5200	4/1	12	3.2	3.0	4.6	5.3*	17
(Musselshell)									
Grasshopper	10C2	7000	4/1	24	6.4	6.0	3.3	5.4	21
UPPER YELLOWSTONE									
Camp Senia	9D1	7890	3/23	32	7.0	5.4	3.8	6.8	21
Canyon	10E3	7500	4/1	52	15.0	13.2	17.1	13.3*	20
Cooke City	10D7	7400	4/1	35	9.4	6.1	9.9	8.3	22
Crevice Mt.	10D5	8400	3/31	34	8.5	6.1	7.9	10.4	24
Independence	10D6	8000	4/6	51	19.6	15.2	17.0	18.6*	16
Lake Camp	10E4	7850	4/1	39.	9.6	9.4	10.5	10.8*	20
Lodgepole, Wyo.	9E1	8200	3/27	42	11.8	8.9	12.3	10.7*	20
Lupine	10E1	7300	4/1	34	9.4	7.0	11.4	10.7*	19
#Astor Creek	10E8	7700				24.8	35.3	30.1	40
#Thumb Divide	10E7	7900	4/1	66	19.8	17.6	25.3	26.7**	12
(Shields River)									
Porcupine	10C3	6500	3/30	27	7.3	6.3	6.3	6.3*	20

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MONTANA SNOW SURVEYS ABOUT APRIL 1, 1959

MISSOURI DRAINAGE BASIN AND SNOW COURSE	No.	Elev.	SNOW COVER MEASUREMENTS: Date of Survey	1959 Snow Depth (In.)	1959 Water Content (In.)	Past Record Water Content (In.) 1958	Past Record Water Content (In.) 1957	15-Year Average 1938-52	Total Years of Record
LOWER YELLOWSTONE - Wind River									
Big Warm	9F12	8800	3/26	34	8.9	6.3	9.0	-	4
Burroughs Creek	9F4	8800	3/27	45	14.4	10.6	12.1	15.7**	10
Dinwoodie	9F10	10000	3/30	48	11.6	7.9	10.9	13.9**	9
∓#Dinwoodie Glacier	9F17	10500	4/3	48	11.5				
Dry Creek	9F9	9500	3/30	32	6.8	4.7	5.3	7.4**	9
DuNoir	9F6	8750	3/26	29	7.4	5.5	7.2	9.7*	18
Geyser Creek	9F7	8500	3/26	30	6.6	4.2	7.2	9.0**	10
Little Warm	9F8	9500	3/25	59	16.7	12.1	17.1	19.1	10
Sheridan R.S. #2	9F14	7500	3/26	26	6.4	5.5	7.0		4
T-Cross Ranch	9F3	8000	3/27	23	6.2	3.5	6.0	7.5*	18
#Togwotee Pass	10F9	9600	3/30	84	32.2	26.2	27.9	29.2	23
LOWER YELLOWSTONE - Popo Agie River									
Blue Ridge	8G2	9500	4/2	40	9.8	7.5	9.0	12.6*	19
Hobbs Park	9G3	10000	3/28	61	15.7	10.1	16.4	19.8**	10
Mosquito Park R.S.	9G4	9500	3/28	36	7.0	4.8	6.6	9.0**	14
Sawmill Glade	5G1	8500	4/2	33	9.0	6.2	5.2	8.2*	19
#South Pass	8G3	9000	4/2	40	11.6	8.6	13.7	14.9*	19
St. Lawrence R.S.	9F11	9000	3/30	32	6.2	3.2	5.5	7.6**	15
Trout Creek	9G2	8400	3/28	35	7.8	4.4	4.3	6.4**	10
∓#Twenty Lakes	9G7	10500	4/3	34	6.5				
LOWER YELLOWSTONE - Owl Creek									
Beavers Mill	9F2	8900	3/23	27	6.2	4.6	6.2	6.8**	8
Owl Creek	8F1	8700	3/23	26	5.8	5.5	3.9	5.9**	9
LOWER YELLOWSTONE - Greybull River									
Timber Creek #2	9F3	8800	3/25	15	3.6	5.2	2.7	3.7[a]	10
Wood River #2	9F15	8000	3/24	25	5.6	5.0	4.7		4
LOWER YELLOWSTONE - Shoshone River									
Carter Mountain	9E4	7800	3/26	21	4.8	4.8	4.0		2
#East Entrance	10E6	7000	3/30	38	11.2	9.2	11.5	12.6**	10
#Sylvan Pass	10E5	7100	3/30	47	15.9	13.1	14.9	14.9*	20
#Togwotee Pass	10F9	9600	3/30	84	32.2	26.2	27.9	29.2	23

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** Average for period of record.
\# Adjacent Basin.
∓ Aerial Stadia Marker.
a Average estimated from Timber Creek #1.

MONTANA SNOW SURVEYS ABOUT APRIL 1, 1959

MISSOURI DRAINAGE BASIN AND SNOW COURSE	No.	Elev.	SNOW COVER MEASUREMENTS: Date of Survey	1959 Snow Depth (In.)	1959 Water Content (In.)	Past Record Water Content (In.) 1958	Past Record Water Content (In.) 1957	15-Year Average 1938-52	Total Years of Record
LOWER YELLOWSTONE - Nowood Creek									
Cold Springs Camp	7E25	8700	4/2	36	10.2	7.4	6.6		3
Medicine Lodge Lake	7E24	9500	4/2	50	13.2	11.7	10.5		3
#Munkres Pass	7E8	9700	3/31	41	10.4	8.8	9.0	9.1**	9
#Onion Gulch	7E27	8100	4/1	40	10.3	7.8	8.2		3
Tensleep Lake	7E26	9075	3/30	49	13.8	9.7	10.0		3
Tensleep R.S.	7E7	8300	3/30	38	10.2	6.9	7.5	7.2	21
Tyrell R.S.	7E35	8300	3/30	42	10.8	7.2	7.0		3
LOWER YELLOWSTONE - Shell Creek									
#Bald Mountain	7E21	9600	3/25	75	26.4	16.3	16.6		3
#Beaver Tongue	7E20	9200	3/24	76	25.7	14.6	14.7		3
#Bone Spring	7E18	9200	3/26	66	21.0	13.2	15.1		3
Granite Cr. Camp	7E22	7800	3/27	25	5.8	4.6	3.4		3
#Granite Pass	7E17	8950	3/26	67	21.1	13.1	14.6		3
Ranger Creek	7E4	8800	3/27	42	11.9	7.8	8.8	8.4*	21
Shell Creek	7E23	9600	3/27	53	16.6	12.5	14.9		3
LOWER YELLOWSTONE - Porcupine Creek									
Five Springs Falls	7E31	7500	3/31	20	6.5	5.6	4.4		3
#Medicine Wheel	7E30	9000	3/25	67	23.8	13.1	12.7		3
LOWER YELLOWSTONE - Tongue River									
#Beaver Tongue	7E20	9200	3/24	76	25.7	14.6	14.7		3
Big Goose #2	7E32	7700	3/30	41	10.4	5.2	6.7		3
#Bone Spring	7E18	9200	3/26	66	21.0	13.2	15.1		3
Burgess R.S. #2	7E33	7900	3/26	41	11.3	5.3	6.2		3
Dome Lake #2	7E34	8800	3/30	45	11.6	7.8	9.3		3
Gloom Creek	7E14	9300	3/27	57	17.0	10.3	10.5		3
#Granite Pass	7E17	8950	3/26	67	21.1	13.1	14.6		3
Sibley Lake	7E11	8000	3/24	49	14.5	7.8	7.2		3
Sucker Creek	7E12	9000	3/27	54	16.2	9.9	8.8		3
Steamboat Point	7E10	7500	3/27	44	12.3	5.1	5.1		3
Wood Rock G.S.	7E13	8500	3/27	49	14.0	7.8	9.4		3
LOWER YELLOWSTONE - Powder River									
#Muddy Creek G.S.	7E28	7800	3/31	23	4.8	4.3	3.5		3
#Munkres Pass	7E8	9700	3/31	41	10.4	8.8	9.0	9.1**	9
#Onion Gulch	7E27	8100	4/1	40	10.3	7.8	8.2		3
Soldier Park	7E5	8700	4/1	32	8.6	6.4	4.1	5.4	7
Sour Dough	7E6	8500	4/2	33	8.1	6.6	6.7	6.1	22

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MONTANA SNOW SURVEYS ABOUT APRIL 1, 1959

COLUMBIA DRAINAGE BASIN AND SNOW COURSE	No.	Elev.	SNOW COVER MEASUREMENTS: Date of Survey	1959 Snow Depth (In.)	1959 Water Content (In.)	Past Record Water Content (In.) 1958	1957	15-Year Average 1938-52	Total Years of Record
KOOTENAI RIVER (above Libby, Montana)									
Baree Creek	15B11	5500	4/1	136	57.2	42.1	50.4	51.1**	3
Baree Mountain	15B1	6000	4/1	138	54.3	40.1	43.2	40.5*	20
Brush Creek	14A4	5000	3/26	47	14.8	12.1	13.4	13.0**	14
Fernie	Can	3500	3/31	24	8.4	5.6	8.3	7.6	21
Ferguson	Can	2900	3/31	63	25.4	19.9	23.6	19.5	21
Gray Creek	Can	5100	3/26	64	18.7	13.9	19.9	19.9**	11
Kimberley	Can	3800	3/30	24	6.7	5.2	6.3	5.5	21
Marble Canyon	Can	5000	3/31	51	13.5	12.0	14.8	14.7**	12
Nelson Creek	Can	3050	3/31	44	15.6	13.7	17.8	13.8	21
New Fernie	Can	4100	3/31	47	15.2	12.0	13.3	16.0**	8
Red Mountain	15A1	6000	3/24	62	20.2	16.1	20.1	19.1*	20
Sinclair Pass	Can	4500	3/31	18	4.7	2.5	7.3	5.0	22
Smith Creek	16A1	4800	3/30	129	49.4	42.9	48.6	42.7*	20
Sullivan Mine	Can	5100	3/30	47	14.6	12.9	14.5	15.8**	13
Upper Elk River	Can	4400	3/30	24	7.7	3.4	9.0	8.8**	11
Weasel Divide	14A7	5450	4/4	98	33.9	29.0	35.4	30.9*	20
FLATHEAD RIVER									
Basin Creek	13B14A	5000	4/3	30	9.1	7.9	5.8	9.8**	8
Big Creek	13B3	6750	4/4	141	60.5	49.3	44.5	40.6*	18
Brush Creek	14A4	5000	3/26	47	14.8	12.1	13.4	13.0**	14
Cattle Queen	13A1	4700	4/1	131	34.4	26.2	29.5	30.7*	20
Coyote Hill	13B10	4200	4/1	34	12.4	9.9	8.2	11.1**	12
Desert Mountain	13A2M	5600	3/27	50	17.6	14.5	16.2	14.8*	20
Goat Mountain	12B7	7000	3/29	48	15.4	9.7	10.2	10.3*	20
Hell Roaring Div.	14A3	5700	3/23	98	32.5	29.5	34.0	30.4*	17
Holbrook	13B13A	4530	4/3	33	11.8	8.1	7.7	10.2**	8
Kishenehn	14A2	4300	3/30	29	8.9	7.9	10.9	9.3*	20
Logan Creek	14A5	4300	3/26	37	11.1	8.6	9.3	8.2*	20
Marias Pass	13A5M	5250	3/28	59	21.1	14.2	18.4	17.6	23
Mineral Creek	13A16	4500	4/2	60	23.3	16.9	18.7	17.8**	2
N. Fork Jocko	13B7	6330	4/3	149	62.4	46.4	42.1	40.9*	18
Quintonkon	13A13	3800	3/31	57	20.2	13.0	10.1	14.6**	8
Spotted Bear Mt.	13B2M	7000	4/1	58	21.1	11.4	14.1	15.5**	11
Strawberry Lake	13A10	6500	3/31	146	56.7	45.9	39.9	44.2**	11
Trinkus Lake	13B1	6500	3/30	147	69.4	42.8	35.8	42.4**	11
Trout Lake	13A12M	3600	4/2	49	17.8	12.4	14.2	17.3**	11
Twin Creeks	13B11	3580	4/2	41	15.6	10.0	8.5	11.1**	8
Upper Holland	13B5	7000	4/1	125	48.9	31.7	31.5	36.9**	10
Weasel Divide	14A7	5450	4/4	98	33.9	29.0	35.4	30.9*	20

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MONTANA SNOW SURVEYS ABOUT APRIL 1, 1959

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CLARK FORK									
Baree Creek	15B11	5500	4/1	136	57.2	42.1	50.4	51.1**	3
Baree Mountain	15B1	6000	4/1	138	54.3	40.1	43.2	40.5**	20
Black Pine	13C13	7100	3/26	45	14.9	-	-	New	0
Chessman Res.	12C5	6200	3/31	20	6.0	4.5	2.5	4.7	23
Coyote Hill	13B10	4200	4/1	34	12.4	9.9	8.2	11.1**	12
East Fork R.S.	13D1	5400	3/30	23	7.5	8.9	7.1	5.7*	20
Eldorado Mine	13C9	7800	3/27	65	23.3	18.0	18.6	22.0**	7
Fish Lake Airstrip	15C2	5000	4/3	111	41.7	36.8	40.2	38.6**	5
Fred Burr Pass	13C11	8000	3/23	78	29.9	23.8	21.4	22.6**	2
Freezeout Summit	15B10	6800	3/31	110	37.0	41.4	30.5	32.0	22
Gold Creek Lake	13C10	7200	3/27	52	17.8	13.4	14.6	17.0**	6
Hoodoo Creek	15C1	6200	3/31	146	56.1	44.7	50.4	47.3	22
Intergaard	13C4	6450	4/1	28	8.4	8.8	8.2	7.6**	14
Lubrecht For. #6	13C8	5400	4/2	5	2.2	3.7	3.8	3.7**	8
N. Fork Jocko	13B7	6330	4/3	149	62.4	46.4	42.1	40.9*	18
Picnic Grounds	12C6	6500	4/1	16	4.5	5.1	3.9	4.6**	13
Pipestone Pass	12D1	7200	3/31	23	6.2	8.4	6.5	5.7*	20
Red Lion	13C12	7000	3/23	57	18.2	17.0	-	-	1
Skalkaho Summit	13C3	7258	3/24	79	28.4	21.6	25.1	25.2	20
Slide Rock Mt.	13C2	7100	3/25	48	15.7	13.2	12.8	15.3	22
Smith Creek	16A1	4800	3/30	129	49.4	42.9	48.6	43.0*	20
Southern Cross	13C5	6500	4/1	17	6.8	7.3	7.6	6.2**	13
Stemple Pass	12C1	6900	3/30	47	15.1	11.5	9.2	9.8*	20
Storm Lake	13C7	7780	3/23	50	15.6	14.4	12.0	14.8*	20
Stuart Mill	13C6	6500	4/1	25	7.7	7.4	6.4	6.3**	13
Stuart Mt. #1	13C1	7400	3/31	91	36.1	32.7	36.0	30.5	22
Tenmile, Lower	12C2	6250	3/28	26	7.9	7.1	5.0	6.5	23
Tenmile, Middle	12C3	6800	3/27	39	11.8	11.3	8.8	10.5	23
Tenmile, Upper	12C4	8000	3/27	47	16.1	14.7	11.4	13.5	23
TV Mountain	14B1	6800	3/30	66	22.0	18.8	19.0	20.6**	3
#49 Meadows	15B3	5000	3/31	94	33.0	33.4	31.2	35.0	22
#Lookout	15B2	5250	3/31	112	39.8	34.9	36.0	33.5	22

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BITTERROOT									
East Fork R.S.	13D1	5400	3/30	23	7.5	8.9	7.1	5.7*	20
Gibbons Pass	13D2	7100	3/31	68	23.5	23.1	24.7	23.8	20
Nez Perce Camp	14D2	5580	4/1	43	14.1	15.0	14.6	13.5	22
Nez Perce Pass	14D1	6575	4/1	52	17.4	14.7	14.6	17.7	22
Skalkaho Summit	13C3	7259	3/24	79	28.4	21.6	25.1	25.2*	20
Stuart Mt. #1	13C1	7400	3/31	91	36.1	32.7	36.0	30.5	22
#Kit Carson	14D3	4700	4/1	26	9.2	7.4	7.6	7.8	21
#Lolo Pass	14C5	5230	3/26	85	32.0	29.7	34.5	32.5	21
#Moose Creek	13D16	6200	3/27	42	14.8	15.8	16.4	16.2	22
#Powell R.S.	14C6	4230	3/27	31	11.4	9.6	13.0	13.6**	3
#Savage Pass	14C4	6000	3/27	83	29.4	24.5	31.5	27.0	21

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STATUS OF RESERVOIR STORAGE
APRIL 1, 1959

BASIN & STREAM	RESERVOIR	USABLE CAPACITY 1000 A.F.	USABLE STORAGE - 1000 ACRE FEET 1959	1958	1957	1938-52 AVG.	YRS.
MISSOURI RIVER BASIN - MONTANA							
Beaverhead	Lima	84.0	30.6	27.0	6.5	34.5*	18
Madison River	Hebgen Lake	345.0	167.6	156.0	170.1	226.8	23
Madison River	Ennis Lake	41.0	38.4	38.7	37.1	33.3	23
Hyalite Creek	Middle Creek	8.0	4.3	3.9	3.4	4.0**	7
Missouri River	Canyon Ferry	2043.0	1774.0	1598.0	1440.0	1328.0**	5
Missouri River	Hauser Lake & Lake Helena	62.5	53.6	7.9	60.8	37.8*	19
Missouri River	Lake Helena	10.4	7.6	0	9.8	5.3**	13
Missouri River	Holter Lake	81.9	51.8	61.3	68.9	53.2	21
N. Fk. Sun River	Gibson	105.0	61.9	31.2	42.0	64.3	23
N. Fk. Sun River	Willow Creek	32.3	28.7	20.6	24.0	13.7	23
N. Fk. Sun River	Pishkun	32.0	19.4	12.1	16.2	15.5	23
Marias River	Tiber	1316.0	720.4	638.6	611.3	-	3
Birch Creek	Swift	30.0	30.1	21.0	24.9	21.9	23
Dupuyer & Birch	Lake Francis	112.0	96.6	94.1	90.6	74.4	23
Judith River	Ackley Lake	5.8			3.7	4.2*	19
Missouri River	Ft. Peck 3/	19410.0	9637.0	7900.0	6244.0	11630.0*	18
Milk River	Fresno	127.2	86.8	63.6	110.2	75.1*	18
Milk River	Nelson	66.8	42.5	47.9	49.4	29.0	23
W. Rosebud Cr.	Mystic Lake	20.8	4.2	-	4.6	6.3	22
Tongue River	Tongue River	73.9	33.3	10.8	14.6	18.1*	18
Swiftcurrent Cr.	Sherburne Lk.	66.1	36.9	23.4	21.1	21.5	23
MISSOURI RIVER BASIN - WYOMING							
Shoshone River	Buffalo Bill	440.0	13.6	130.0	116.4	252.8	24
Wind River	Boysen	408.6AC	198.1	212.6	192.6	243.8**	7
Wind River	Pilot Butte	31.6	12.1	20.7	21.8	17.1	23
Bull Creek	Bull Lake	152.0	45.5	60.6	63.2	54.0*	19
Belle Fourche	Key Hole	190.0AC	4.7	2.8	2.6	11.4**	7

* Less than 15 years in 1938-52 period. Average for 15 years nearest the base period.
** Average for period of record.
3/ Gross contents: usable capacity less 617.0 A.F; minimum power pool 4,500.0 A.F.
AC Active Capacity - USBR Billings.

STATUS OF RESERVOIR STORAGE
APRIL 1, 1959

BASIN & STREAM	RESERVOIR	USABLE CAPACITY 1000 A.F.	USABLE STORAGE - 1000 ACRE FEET 1959	1958	1957	1938-52 AVG.	YRS.
MISSOURI RIVER BASIN - NORTH DAKOTA							
Heart River	Heart Butte	54.8AC	78.3	72.1	46.9	62.2**	9
Heart River	Dickinson	4.3AC	5.8	6.1	3.9	5.5**	8
Missouri River	Garrison Lk.	13805.0AC	3965.9	4565.0	1002.8	-	4
James River	Jamestown	20.0AC	11.4	13.0	4.9	-	2
MISSOURI RIVER BASIN - SOUTH DAKOTA							
Belle Fourche	Belle Fourche	185.0AC	58.2	78.2	49.9	-	2
Cheyenne River	Angostura	160.0AC	50.6	58.1	33.5	-	3
Cheyenne River	Deerfield	15.1AC	9.3	11.6	8.6	11.7**	5
Grand River	Shadehill	84.0AC	86.0	80.9	93.7	83.9**	6
Missouri River	Ft. Randall	4900.0AC	2979.0	2289.6	1752.2	-	4
Missouri River	Gavins Point	385.0AC	306.4	288.7	207.7	-	2
Missouri River	Oahe	Total	751.0	-	-	New	-
Cheyenne River	Pactola	55.0AC	19.4	14.6	2.0	-	2
COLUMBIA RIVER BASIN - MONTANA							
Flint Creek	Georgetown Lk.	31.0	23.2	19.7	17.3	21.8**	19
S. Fk. Flathead	Hungry Horse	3500.0	2286.0	2115.0	1810.0	2022.0	5
Flathead River	Flathead Lake	1791.0	883.4	583.0	592.0	587.0	15
Flathead River 6/	Camas Res.	42.8	28.9	32.2	31.5	22.3*	18
Flathead River 7/	Mission Valley	98.6	34.2	22.7	30.7	40.2*	18

* Less than 15 years in 1938-52 period. Average for 15 years nearest the base period.
** Average for period of record.
6/ Camas Reservoirs are shown as a sum of (4) small reservoirs on the west side of Flathead Lake located on Dry Creek and Little Bitterroot River.
7/ Mission Valley Reservoirs are shown as a sum of (8) small reservoirs located south and east of Flathead Lake. Both Camas and Mission Valley reservoirs are operated by the Indian Irrigation Service.
AC Active Capacity; USBR Billings.

UPPER MISSOURI RIVER BASIN
SNOW SURVEY COURSES
IN
MONTANA & NORTHERN WYOMING

LEGEND
- □ TOWNS AND CITIES
- ● 1304 SNOW SURVEY COURSE
- ○ 9G1 IDAHO & WYOMING NUMBERS
- ▲ STREAM GAGING STATIONS

1959

U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE
BOZEMAN MONTANA

SCALE IN MILES 50 25 0 50 100

KOOTENAI
FLATHEAD
ST. MARY
MILK
MARIAS
MILK
CLARK FORK
SO. FORK FLATHEAD
TETON
SUN
UPPER MISSOURI
BLACKFOOT
LEWISTOWN
YELLOWSTONE
LOWER YELLOWSTONE
MUSSELSHELL
BITTERROOT
BIG HOLE
JEFFERSON
BEAVERHEAD
RUBY
MADISON
GALLATIN
UPPER YELLOWSTONE
SHOSHONE
GREYBULL
BIGHORN
NOWOOD
POWDER
TONGUE
WIND
POPO AGIE
SHELL
SOUTH DAKOTA
MONTANA
WYOMING
IDAHO
LIBBY
KALISPELL
COLUMBIA FALLS
NERDON
THOMPSON FALLS
POLSON
PLAINS
ST REGIS
MISSOULA
OVANDO
HAMILTON
DARBY
HELENA
ANACONDA
BUTTE
DILLON
BOZEMAN
LIVINGSTON
CORWIN SPRINGS
CLARK (YELLOWSTONE) FORK RIVER
REO LODGE
WILSALL
HARLOWTON
SHELBY
CHOTEAU
AUGUSTA
GREAT FALLS
HAVRE
GLASGOW
FORT PECK RESERVOIR
MILES CITY
BILLINGS
SHERIDAN
ARVADA
BUFFALO
KAYCEE
WORLAND
THERMOPOLIS
MEETEETSE
COODY
DUBOIS
RIVERTON
LANDER

INDEX TO MONTANA & NORTHERN WYOMING SNOW COURSES

Drainage Basin and Course Name	Montana Number	Elev.	Location Sec. Lat.	Twp.	Range Long.	Record Began	Measuring Dates	Measured By
JEFFERSON RIVER		MISSOURI RIVER DRAINAGE						
(ROCK-BEARTOOTHEAD)								
Lakeview Ridge	11E3	7400	27	11S	2W	1948	3,4,5	10
Lakeview Canyon	11E4	6930	26	11S	2W	1948	3,4,5	10
Limekiln	12E2	6950	5	15S	9W	1948	3,4	1
White Pine Ridge	12E1	8850	18	14S	9W	1948	3,4	1
(HORSE PRAIRIE)								
Bloody Dick	13D10	7600	12	8S	16W	1948	3,4	1
Gold Stone	13D9	8100	11	8S	16W	1948	3,4	1
Lemhi Pass	13E1	7480	9	10S	15W	1948	3,4	1
Terrell Creek	13D12	6650	14	9S	15W	1948	3,4	1
Trail Creek	13E2	7090	15	10S	15W	1948	3,4	1
Selway Junction	13D11	6800	27	8S	15W	1948	3,4	1
(BIG HOLE)								
Big Hole Pass	13D3	7240	28	3S	18W	1948	3,4	1
Big Hole Pass-Se.	13D4	6900	24	3S	18W	1948	3,4	1
East Boundary	13D5	6700	22	3S	17W	1948	3,4	1
Gibbons Pass	13D2	7100	4	2S	19W	1934	1,2,3,4,5	1,3
Jahnke Creek	13D8	7340	25	7S	16W	1948	3,4	1
Miner Forks	13D6	7300	24	6S	17W	1948	3,4	1
Miner Lake	13D7	6720	10	6S	16W	1945	3,4,5	1
(WISE RIVER)								
Anderson Mdw.	13D14	7000	18	3S	12W	1948	3,4	1
Elk Horn	13D15	8450	15	4S	12W	1935	3,4,5	3
Wise River	13D13	6300	15	2S	12W	1948	3,4	1
(RUBY RIVER)								
Flashlight	12D3	6950	22	8S	7W	1945	3,4,5	1
MADISON RIVER								
Hebgen	11E5	6550	22	11S	3E	1934	1,2,3,4,5	3
West Yellowstone	11E7	6700	34	13S	5E	1934	1,2,3,4,5	3
Norris Basin	10E2	7500	44°44'		110°42'	1936	3,4	6
GALLATIN RIVER								
Devil's Slide	10D4	8100	14	5S	6E	1935	2,3,4,5	2,1
Hood Meadow	10D3	6600	22	4S	6E	1935	2,3,4,5	2,1
New World	10D1	6700	24	3S	6E	1939	1,2,3,4,5	7
21-Mile	11E6	7150	1	11S	5E	1934	1,2,3,4,5	3
MISSOURI RIVER MAIN STEM								
Chessman Reservoir	12C5	6200	2	6N	5W	1936	1,2,3,4,5	3
Crystal Lake	9C1	6100	19	12N	18E	1941	3,4	1,2
Grasshopper	10C2	7000	19	9N	8E	1938	3,4	2
Kings Hill	10C1	7950	35	13N	7E	1934	3,4,5	3
Picnic Grounds	12C6	6500	10	5N	6W	1941	2,3,4	4
Pipestone Pass	12D1	7200	11	1N	7W	1938	2,3,4,5	1
Stemple Pass	12C1	6900	16	13N	7W	1934	3,4,5	3
Ten Mile Creek L	12C2	6250	13	8N	6W	1935	1,2,3,4,5	3
Ten Mile Creek M	12C3	6800	13	8N	6W	1934	1,2,3,4,5	3
Ten Mile Creek U	12C4	8000	19	8N	5W	1935	1,2,3,4,5	3
(TETON RIVER)								
Freight Creek	12A1	6000	13	26N	10W	1948	3,4	1
Waldron Creek	12B2	5600	16	25N	9W	1948	3,4	1
West Fork	12B1	6000	6	25N	9W	1948	3,4	1
(SUN RIVER)								
Benchmark	12B8	5500	9	20N	10W	1948	3,4	1
Cabin Creek	12B6	5400	33	23N	10W	1949	3,4	1,2
5-Ball	12B9	5600	36	20N	10W	1948	3,4	1,2
Gates Park	12B5	5300	31	24N	10W	1949	3,4	1,2
Goat Mountain	12B7	7000	20	22N	10W	1934	3,4	3
Wrong Ridge	12B3	6800	17	25N	10W	1949	3,4	1,2
Wrong Creek	12B4	5700	32	25N	10W	1949	3,4	1,2
(MARIAS RIVER)								
Marias Pass	13A5M	5250	34	30N	14W	1934	1,2,3,4,5	3
MILK RIVER)								
Rocky Boy	9A1	5200	15	28N	16E	1941	3,4	7
(MUSSELSHELL RIVER)								
Grasshopper	10C2	7000	19	9N	8E	1938	3,4	2

Drainage Basin and Course Name	Montana Number	Elev.	Location Sec. Lat.	Twp.	Range Long.	Record Began	Measuring Dates	Measured By
MISSOURI RIVER DRAINAGE (cont.)								
(UPPER YELLOWSTONE)								
Camp Senia	9D1	7890	2	8S	18E	1937	4	1
Canyon	10E3	7750	44°-44'		110°-30'	1938	1,2,3,4,5	6
Cooke City	10D7	7400	25	9S	14E	1937	1,2,3,4,5	6
Crevice Mt.	10D5	8400	22	9S	9E	1935	3,4	2
Independence	10D6	8000	22	7S	12E	1940	3,4	1
Lake Camp	10E4	7850	44°-34'		110°-24'	1936	1,2,3,4,5	6
Lupine Creek	10E1	7300	44°-54'		110°-37'	1938	1,2,3,4,5	6
Lodgepole	9E1	8200	32	56N	106W	1940	2,3,4,5	1,4
(SHIELDS RIVER)								
Porcupine	10C3	6500	10	4N	10E	1938	3,4	1
LOWER YELLOWSTONE								
(WIND RIVER) Wyoming								
Big Warm	9F12	8800	36	42N	109W	1955	2,3,4,5	1
Brooke Lake #3	10F8	9200	23	44N	110W	1939	2,3,4,5	1
Burroughs Creek	9F4	8800	15	43N	107W	1948	2,3,4,5	1
Dinwoodie	9F10	10000	21	39N	105W	1948	2,3,4,5	1
Dry Creek	9F9	9500	34	4N	6W	1948	2,3,4,5	1
DuNoir	9F6	8750	27	42N	108W	1940	2,3,4,5	1
East Fork	9F13	9200	23	44N	104W	1956	2,3,4,5	1
Geyser Creek	9F7	8500	12	41N	108W	1948	2,3,4,5	1
Little Warm	9F8	9500	24	41N	108W	1948	2,3,4,5	1
Sheridan B.S. #1	9F5	7500	3	42N	109W	1939	2,3,4,5	1
Sheridan B.S. #2	9F14	7500	3	42N	109W	1955	2,3,4,5	1
T-Cross Ranch	9F3	8000	1	43N	107W	1940	2,3,4,5	1
Togwotee Pass	10F9	9600	29	44N	110W	1936	2,3,4,5	11
(POPO AGIE RIVER) Wyoming								
Blue Ridge	8G2	9500	23	31N	101W	1939	2,3,4,5	1
Bruce's Camp	8G5	6500	24	32N	101W	1955	2,3,4	1
Bobb's Park	9G3	10000	22	2S	3W	1948	2,3,4,5	1
Mosquito Park B.S.	9G4	9500	23	2S	3W	1940	2,3,4,5	1
Sawmill Glade	8G1	8500	3	31N	101W	1939	2,3,4,5	1
South Pass	8G3	9000	13	30N	101W	1939	2,3,4,5	1
St. Lawrence	9F11	9000	26	1N	4W	1940	2,3,4,5	1
Trout Creek	9G2	8400	5	2S	2W	1948	2,3,4,5	1
(OWL CREEK) Wyoming								
Beavers Mill	9F2	8900	6	43N	102W	1948	2,3,4,5	1
Owl Creek	8F1	8700	36	43N	101W	1948	2,3,4,5	1
(GREYBULL RIVER) Wyoming								
Timber Creek #1	9E2	8800	25-	47N	103W	1948	2,3,4,5	1
Timber Creek #2	9E3	8800	25	47N	103W	1955	2,3,4,5	1
Wood River #1	9F1	8000	28	46N	103W	1939	2,3,4,5	1
Wood River #2	9F15	8000	28	46N	103W	1956	2,3,4,5	1
(SHOSHONE RIVER) Wyoming								
East Entrance	10E6	7000	17	52N	109W	1948	1,2,3,4,5	6
Sylvan Pass	10E5	7100	12	52N	110W	1936	1,2,3,4,5	6
(NOWOOD CREEK) Wyoming								
Cold Springs Camp	7E25	8700	1	50N	88W	1956	2,3,4,5	1
Medicine Lodge Lks	7E24	9500	7	51N	87W	1956	2,3,4,5	1
Munkere Pass	7E8	9700	11	48N	85W	1950	2,3,4,5	1
North Powder	7E36	8300	20	47N	85W	1956	2,3,4,5	1
Onion Gulch	7E27	8100	31	48N	85W	1956	2,3,4,5	1
Tensleep Lake	7E26	9075	33	50N	86W	1956	2,3,4,5	1
Tensleep B.S.	7E7	8300	30	49N	86W	1935	2,3,4,5	1
Tyrell B.S.	7E35	8300	30	49N	86W	1956	2,3,4,5	1
(SHELL CREEK) Wyoming								
Bald Mountain	7E21	9600	33	56N	91W	1956	2,3,4,5	1
Beaver-Tongue Div.	7E20	9200	12	55N	91W	1956	2,3,4,5	1
Bone-Spring Div.	7E18	9200	32	55N	89W	1956	2,3,4,5	1
Granite Creek Camp	7E22	7800	15	53N	89W	1956	2,3,4,5	1
Granite Pass	7E17	8950	19	54N	88W	1956	2,3,4,5	1
Horse-Trail Div.	7E19	9200	29	55N	90W	1956	2,3,4,5	1
Ranger Creek	7E4	8800	32	53N	88W	1935	2,3,4,5	1
Shell Creek	7E23	9600	12	52N	88W	1956	2,3,4,5	1
(PORCUPINE CREEK) Wyoming								
Five Spge. Falls	7E31	7500	19	56N	92W	1956	2,3,4,5	1
Medicine Wheel	7E30	9000	24	56N	92W	1956	2,3,4,5	1
(TONGUE RIVER) Wyoming								
Beaver Tongue Div.	7E20	9200	12	55N	91W	1956	2,3,4,5	1
Big Goose #1	7E2	7700	4	53N	86W	1935	2,3,4,5	1
Big Goose #2	7E32	7700	4	53N	86W	1955	2,3,4,5	1
Bone-Spring Div.	7E18	9200	32	55N	89W	1956	2,3,4,5	1
Burgess B.S. #1	7E1	7900	36	56N	89W	1950	2,3,4,5	1
Burgess R.S. #2	7E33	7900	36	56N	89W	1955	2,3,4,5	1
Dome Lake #1	7E3	8800	11	53N	87W	1950	2,3,4,5	1
Dome Lake #2	7E34	8800	11	53N	87W	1950	2,3,4,5	1
Gloom Creek	7E14	9300	32	55N	87W	1956	2,3,4,5	1
Granite Pass	7E17	8950	19	54N	88W	1956	2,3,4,5	1

Drainage Basin and Course Name	Montana Number	Elev.	Location Sec. Lat.	Twp.	Range Long.	Record Began	Measuring Dates	Measured By
MISSOURI RIVER DRAINAGE (cont.)								
(TONGUE RIVER cont.)								
Horse Trail Div.	7E19	9200	29	55N	90W	1956	2,3,4,5	1
Lake Geneva	7E16	9000	7	52N	86W	1956	2,3,4,5	1
North Tongue	7E15	8800	17	55N	89W	1956	2,3,4,5	1
Sibley Lake	7E11	8000	10	55N	88W	1956	2,3,4,5	1
Sucker Creek	7E12	9000	19	55N	87W	1956	2,3,4,5	1
Steambost Point	7E10	7500	32	56N	87W	1956	2,3,4,5	1
Wood Rock O.S.	7E13	8500	3	54N	88W	1956	2,3,4,5	1
(POWDER RIVER) Wyoming								
Crazy Woman	6E2	8200	6	47N	84W	1956	2,3,4,5	1
Muddy Creek G.S.	6E1	7800	2	48N	84W	1956	2,3,4,5	1
Munkere Pass	7E8	9700	11	48N	85W	1950	2,3,4,5	1
North Powder #2	7E36	8300	20	47N	85W	1956	2,3,4,5	1
Onion Gulch	7E27	8100	31	48N	85W	1956	2,3,4,5	1
Soldier Park	7E5	8700	36	51N	85W	1950	2,3,4,5	1
Sour Dough	7E6	8500	17	49N	84W	1936	2,3,4,5	1
COLUMBIA RIVER BASIN								
KOOTENAI RIVER								
Baree Creek	15B11	5500	6	25N	30W	1956	4,5,5½	2
Baree Mountain	15B1	6000	1	25N	31W	1937	4,5,5½	2
Red Mountain	15A1	6000	4	36N	29W	1937	3,4,5,5½	1,2
Weasel Divide	14A7	5450	8	37N	24W	1955	4,5,5½	1,2
FLATHEAD RIVER								
Basin Creek	13B14A	5000	11	19N	12W	1951	2,3,4,5	2
Big Creek	13B3	6750	6&7	22N	18W	1941	3,4,5	5
Brush Creek	14A4	5000	13	30N	26W	1937	3,4,5	1,2
Cattle Queen	13A1	4700	7	35N	17W	1939	3,4,5	6
Desert Mountain	13A2M	5600	24	31N	19W	1937	1,2,3,4,5	1,2
Hell Roaring Div.	14A3	5770	35	32N	22W	1942	3,4,5	1,2
Holbrook	13B13A	4530	18	21N	13W	1951	1,2,3,4,5	2
Kishenehn	14A6	3886	14	37N	22W	1954	4,5	6
Logan Creek	14A5	4300	34	30N	24W	1937	3,4,5	2
Marias Pass	13A5M	5250	34	30N	14W	1934	1,2,3,4,5	3
Mineral Creek	13A16	4000	29	35N	17W	1957	3,4,5	6
Quintonkon	13A13	3800	11	26N	17W	1951	2,3,4,5	1,2
Spotted Bear Mt.	13B2M	7000	23	25N	15W	1948	3,4,5	1,2
Strawberry Lake	13A10	6500	11	28N	19W	1948	3,4,5	2
Trinkus Lake	13B1	6500	9	25N	17W	1948	3,4,5	2
Trout Lake	13A12M	3600	21	28N	17W	1948	3,4,5	1,2
Twin Creeks	13B11	3580	14	26N	16W	1951	2,3,4,5	1,2
Upper Holland Lk.	13B5	7000	28	20N	16W	1948	3,4,5	2
CLARK FORK								
Baree Creek	15B11	5500	6	25N	30W	1956	4,5,5½	2
Bares Mountain	15B1	6000	1	25N	31W	1937	4,5,5½	2
Coyote Hill	13B10	4200	12	18N	16W	1952	1,2,3,4,5	2
El Dorado Mine	13C9	7800	23	8N	12W	1949	4	1
Fred Burr Pass	13C11	8000	12	6N	13W	1957	3,4,5	1
Freezeout Summit	15B10	6800	21	15N	27W	1937	4,5	2
Gold Creek Lk.	13C10	7200	14	8N	12W	1949	4	1
Hoodoo Creek	15C1	6200	9	14N	27W	1937	4,5	2
Intergaard	13C4	6450	6	5N	13W	1936	2,3,4	4
Lubrecht Forest #6	13C8	4400	11	14N	15W	1951	1,2,3,4,5	12
North Fork Jocko	13B7	6330	3	17N	17W	1941	3,4,5	5
Pipestone Pass	12D1	7200	10	1N	7W	1938	2,3,4,5	1
Red Lion	13C12	7000	27	6N	13W	1958	3,4,5	1
Slide Rock Mt.	13C2	7100	35	10N	16W	1937	4	1
Southern Cross	13C5	6500	8	5N	13W	1936	2,3,4	4
Stemple Pass	12C1	6900	16	13N	7W	1934	3,4,5	3
Storm Lake	13C7	7780	19	4N	13W	1939	2,3,4	1
Stuart Mill	13C6	6500	19	5N	13W	1936	2,3,4	4
Stuart Mountain	13C1	7400	6	14N	18W	1936	4	1,2
TV Mountain	14B1	6800	33	15N	19W	1956	1,2,3,4,5	1
BITTERROOT RIVER								
East Fork B.S.	13D1	5400	16	2N	17W	1937	4	1
Dibbons Pass	13D2	7100	4	2S	19W	1934	1,2,3,4,5	3,1
Lolo Pass	14C5	5230	16	38N	15E	1956	3,4,5,5½	2
Nez Perce Camp	14D2	5580	19&20	1S	23W	1937	3,4,5	1
Nez Perce Pass	14D1	6575	32	28N	17E	1937	1,2,3,4,4½,5,5½	1
Powell R.S.	14C6	4230	33	37N	14E	1956	3,4,5,5½	2
Skalkaho Summit	13C3	7259	30	6N	17W	1937	4	1
SASKATCHEWAN RIVER BASIN								
ST. MARY RIVER								
Iceberg Lake #3	13A3	5600	48°-50'		113°-43'	1922	5	
Josephine Upper	13A15	5000	48°-50'		113°-42'	1956	5	3,9
Josephine Lower #9	13A14	4900	48°-47'		1130-41'	1955	5	
Mount Allen #7	13A7	5700	48°-46'		113°-41'	1922	5	3,9
Piegan #6	13A6	5500	48°-46½'		1130-41½'	1922	5	3,9
Ptarmigan #8	13A8	5800	48°-50'		113°-44'	1937	5	3,9

a. Numerals 1,2,3,4 and 5 refer to January 1, February 1, March 1, April 1 and May 1.

b. Numerals refer to Agency that secures the snow survey as follows:

1. Soil Conservation Service
2. U. S. Forest Service
3. U. S. Geological Survey
4. Montana Power Company
5. U. S. Indian Service
6. National Park Service
7. Montana Experiment Station
8. City of Bozeman
9. Dominion Water & Power Bureau
10. U. S. Fish and Wildlife Service
11. U. S. Bureau of Reclamation
12. Montana State Forestry School

M - Soil Moisture
A - Aerial Marker

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Agencies Cooperating in Collecting Data Contained in this Bulletin

U. S. Forest Service
Region I, Missoula, Montana

U. S. Geological Survey
Helena, Montana

U. S. Army Corps of Engineers
Portland, Oregon
Seattle, Washington
Omaha, Nebraska
Riverdale, N. D.

U. S. Indian Irrigation Service
St. Ignatius, Montana

U. S. Weather Bureau
Helena, Montana

U. S. Fish & Wildlife Service
Red Rock Lakes Refuge
Monida, Montana

U. S. Bureau of Reclamation
Billings, Montana
Boise, Idaho

Montana Power Company
Butte, Montana

Agricultural Experiment Station
North Montana Branch Station
Havre, Montana

National Park Service
Yellowstone National Park
Glacier National Park

Montana Experiment Station
Montana State College
Bozeman, Montana

City of Bozeman
Bozeman, Montana

Bonneville Power Administration
Portland, Oregon

Montana State School of Forestry
Montana State University
Missoula, Montana

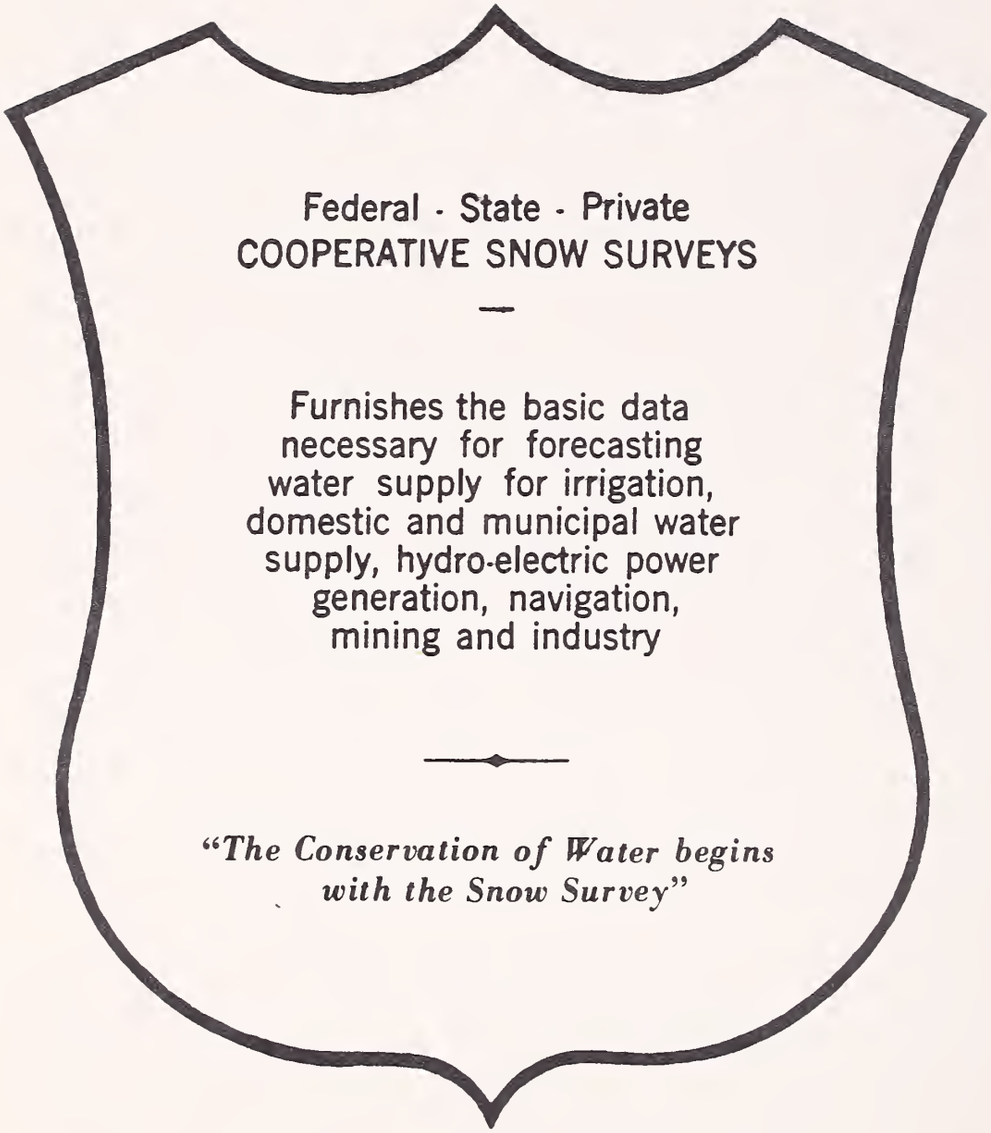
Soil Conservation Service
Montana, Wyoming, Idaho

Soil Conservation Districts
Montana Counties

Johnson Flying Service, Inc.
Missoula, Montana

Water Rights Branch
Dept. of Lands & Forests
Victoria, British Columbia

Department of Northern Affairs
& National Resources
Calgary, Alberta


Federal - State - Private
COOPERATIVE SNOW SURVEYS
Furnishes the basic data
necessary for forecasting
water supply for irrigation,
domestic and municipal water
supply, hydro-electric power
generation, navigation,
mining and industry
"The Conservation of Water begins
with the Snow Survey"